

**Notice of Allowability**

Application No.

09/884,084

Examiner

Ana M Fortuna

Applicant(s)

KOMATSU ET AL.

Art Unit

1723

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/19/04.
2. ☒ The allowed claim(s) is/are 1-32.
3. ☒ The drawings filed on 20 June 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 6/15/04.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

Ana M Fortuna  
Primary Examiner  
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### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Kristen A. Grueneberg on 6/15/04.

The application has been amended as follows:

Amend claims 1 and 6.

1. (Currently amended) A porous hollow fiber membrane obtained by dry-wet spinning method or a wet spinning method from a spinning dope while using the following components:

a spinning dope containing a base polymer as a material for forming said porous hollow fiber membrane,

an additive for facilitating a phase separation of said spinning dope,

a solvent compatible with both, said base polymer and said additive, and a mass of microparticles insoluble in said solvent, wherein said microparticles are uniformly dispersed in a liquid medium and have an average particle size within the range of 1 to 20 um, [and]

wherein an amount of the additive and /or the particle size is adjusted to enhance the coagulation action of the microparticles; and

a coagulating liquid for forming the hollow fiber membrane, to obtain a spun hollow fiber membrane[:], and extracting said additive with cold water or water at a temperature from 40 to 90 degree C; and

extracting and removing said micropartilces by immersing said spun hollow fiber membrane into an extracting solution effective to dissolve said microparticles, but ineffective to dissolve said base polymer;

wherein said hollow fiber membrane has a permselectivity; and wherein a particle weight cutoff is within the range of 1 to 10 um; and [wherein] a pure water permeate flow is equal to or higher than 30,000 L/M2/100 kpa.

6. (Currently amended) a method of making a porous hollow fiber membrane comprising:

forming said hollow fiber membrane according to a dry-wet spinning method or a wet spinning method while using the following components:

a spinning dope containing a base polymer as material forming said porous hollow fiber membrane,

an additive for facilitating a phase separation of said spinning dope,

a solvent compatible with both, said base polymer and said additive, and a mass of micropartilces insoluble in said solvent, wherein said microparticles are uniformly dispersed in a liquid medium and have an average particle size within the range of 1 to 20 um; [and]

wherein an amount of the additive and /or the particle size is adjusted to enhance the coagulation action of the microparticles; and

a coagulation liquid for forming the hollow fiber membrane, to obtain a spun hollow fiber membrane, and extracting said additive with cold water or water at a temperature from 40 to 90 degree C; and

extracting [an removing said additive] said microparticles by immersing said spun hollow fiber membrane into an extracting solution effective to dissolve said microparticles but ineffective to dissolve sad base polymer;

wherein said hollow fiber membrane has a permeability; and wherein a particle cutoff is within the range of 1 to 10  $\mu\text{m}$ ; and [wherein] a pure water permeate flow is equal to or higher than 30,000 L/m<sup>2</sup>/hr/100 kpa.

## **REASONS FOR ALLOWANCE**

2. The following is an examiner's statement of reasons for allowance: claims 1-32 are allowed over the prior art of record. The prior art fails although suggest adding the additive (glycol) to the spinning dope, does not teach adjusting the amount of additive an/or the particles or microparticles size to enhance the coagulation action of the particles., e.g. therefore facilitating formation of particles with a large pore size without defects (microvoids), as in the present invention (bases on page 13, first paragraph). In the present invention as agued by Applicant, the pore size is not only dependent on the particle size, but on the combination of both to prepare the membrane with the large water permeability as claimed in claims 1 and 6.

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3. Withdrawn claims have been rejoined as depending on the allowed independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna  
Primary Examiner  
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June 15, 2004